CHAPTER 2

DESCRIPTION OF THE HARPETH RIVER WATERSHED

2.1 BACKGROUND. The origin of the name “Harpeth” is somewhat obscure. While stories abound about the marauding Harpath Brothers of Kentucky in the 1800’s, the name “Harpath” appears on maps as early as the 1780’s, thus making the family name an unlikely source of the area name. Information in Tennessee State Archives suggests that a Chinese legend describes Harpath as a man who dwelled in a bountiful valley and that early settlers, reading such legends, may have named their beautiful valley after Harpath (later changed to Harpeth).

The Harpeth River Watershed includes cool springs with moderate gradient originating in the Inner Nashville Basin and warm water streams with shallow gradient flowing over

exposed limestone in the Outer Nashville Basin. Even though the Harpeth River Watershed is mostly rural, a few urbanized areas are developing very rapidly.

This Chapter describes the location and characteristics of the Harpeth River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Harpeth River Watershed is located in Middle Tennessee and includes parts of Cheatham, Davidson, Dickson, Hickman, Rutherford, and Williamson Counties.

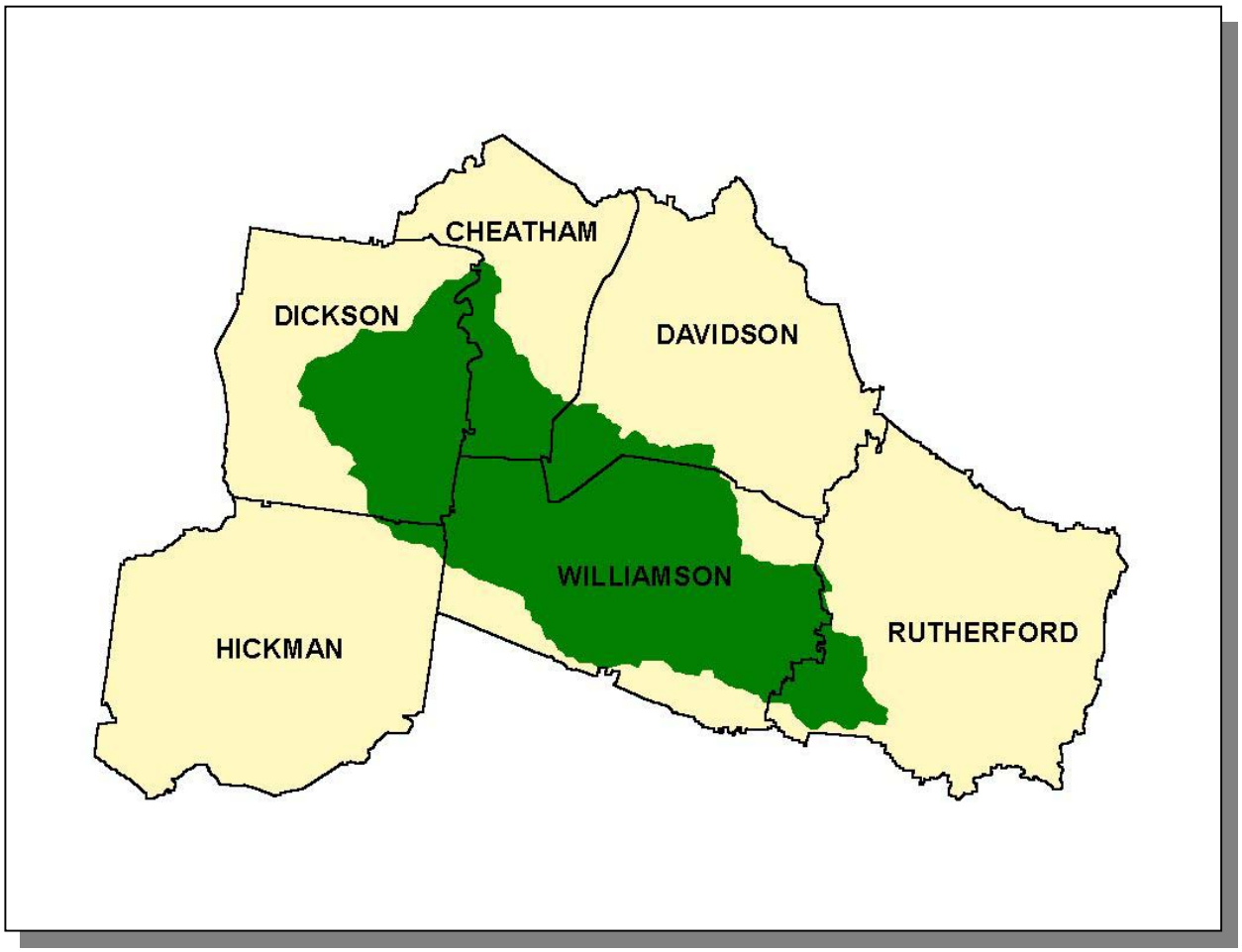

Figure 2-1. General Location of the Harpeth River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Williamson	53.0
Dickson	23.5
Cheatham	10.0
Davidson	6.2
Rutherford	6.2
Hickman	1.1

Table 2-1. The Harpeth River Watershed Includes Parts of Six Middle Tennessee Counties.

2.2.B. Population Density Centers. Two interstates (I-40, I-65) and six state highways serve the major communities in the Harpeth River Watershed.

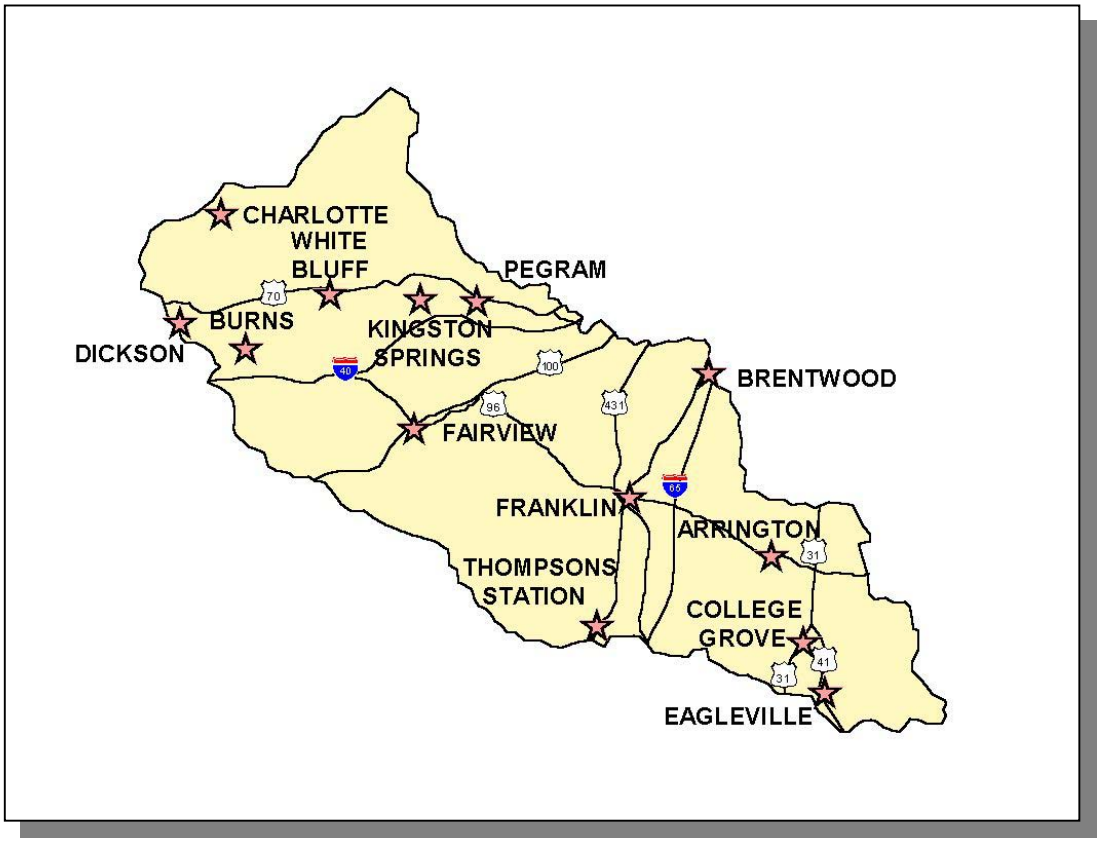

Figure 2-2. Municipalities and Roads in the Harpeth River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Franklin*	20,098	Williamson
Brentwood	16,392	Williamson
Dickson	8,791	Dickson
Fairview	4,210	Williamson
White Bluff	1,988	Dickson
Kingston Springs	1,529	Cheatham
Pegram	1,371	Cheatham
Burns	1,127	Dickson
Charlotte*	854	Dickson
Thompsons Station	721	Williamson
Eagleville	462	Rutherford

Table 2-2. Municipalities in the Harpeth River Watershed. *Population based on 1990 census (Tennessee Blue Book). Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Harpeth River Watershed, designated the Hydrologic Unit Code 05130204 by the USGS, is approximately 863 square miles and drains to the Cumberland River. The mouth of the Harpeth River is at Cumberland River (Cheatham Lake) mile 152.9.

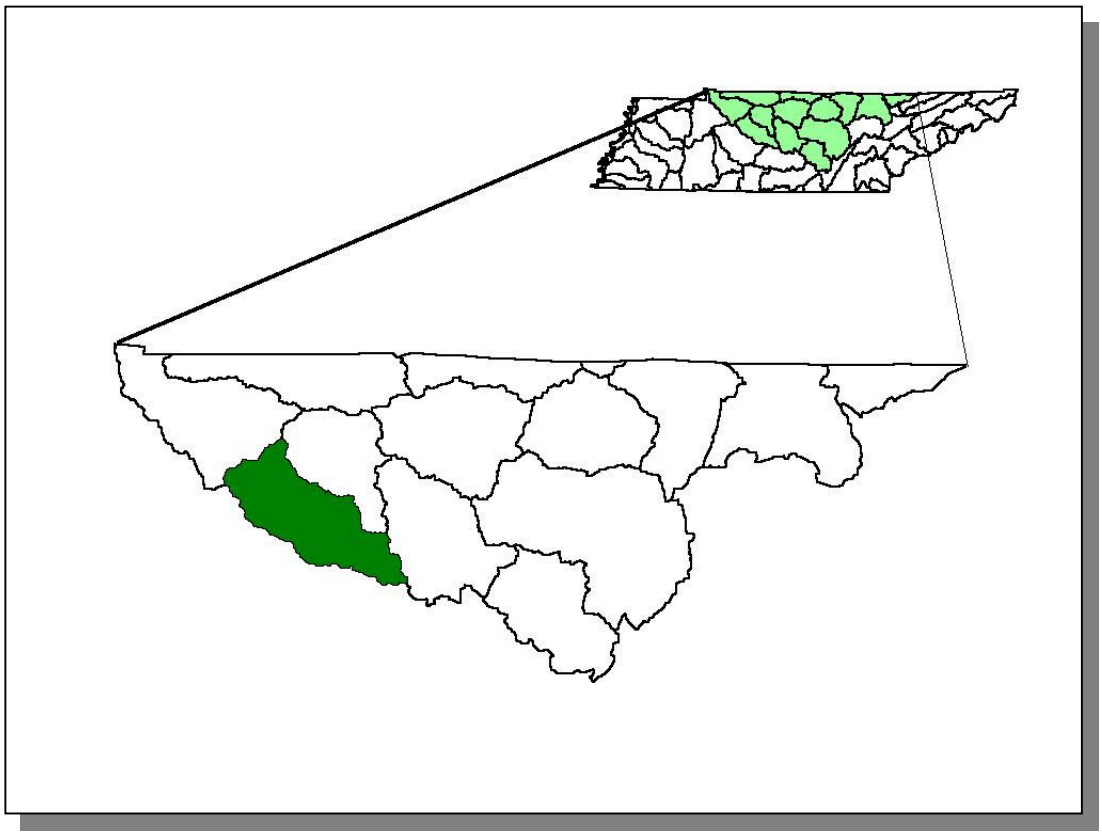

Figure 2-3. The Harpeth River Watershed is Part of the Cumberland River Basin.

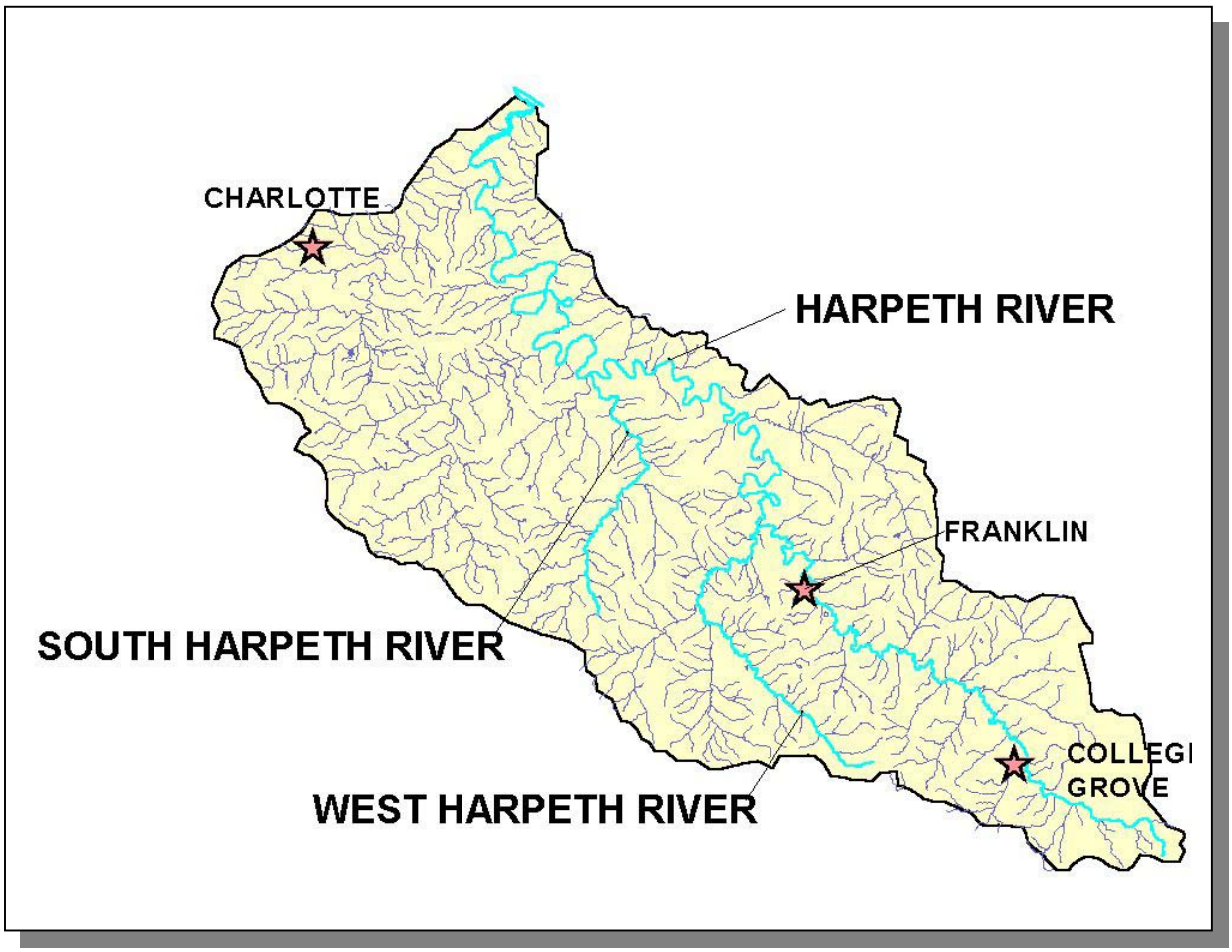

Figure 2-4. Hydrology in the Harpeth River Watershed. *There are 1,314 stream miles and 655 lake acres recorded in River Reach File 3 in the Harpeth River Watershed. Locations of the Harpeth, South Harpeth, and West Harpeth Rivers and the cities of Charlotte, Franklin, and College Grove are shown for reference.*

2.3.B. Dams. There are 53 dams inventoried by TDEC Division of Water Supply in the Harpeth River Watershed. These dams either retain at least 30 acre-feet of water or have structures at least 20 feet high. Additional dams may be found in the watershed.

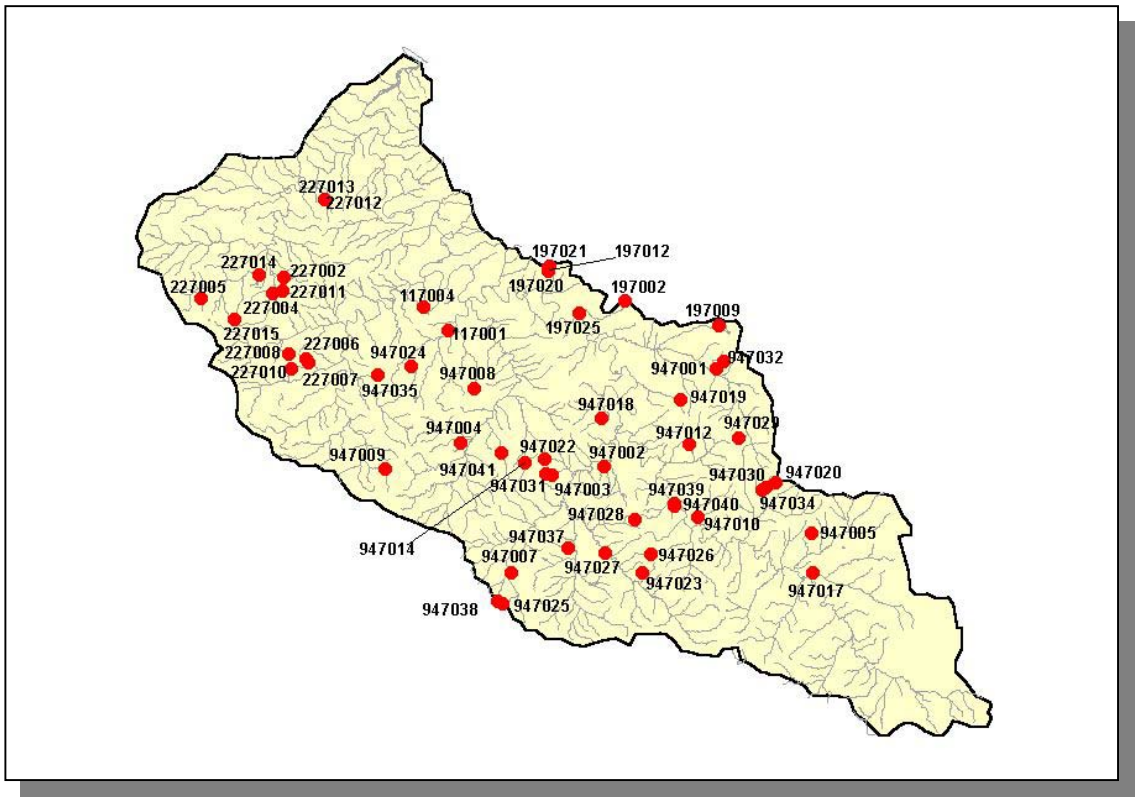

Figure 2-5. Location of Inventoried Dams in the Harpeth River Watershed. *More information is provided in Harpeth-Appendix II.*

2.4 LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

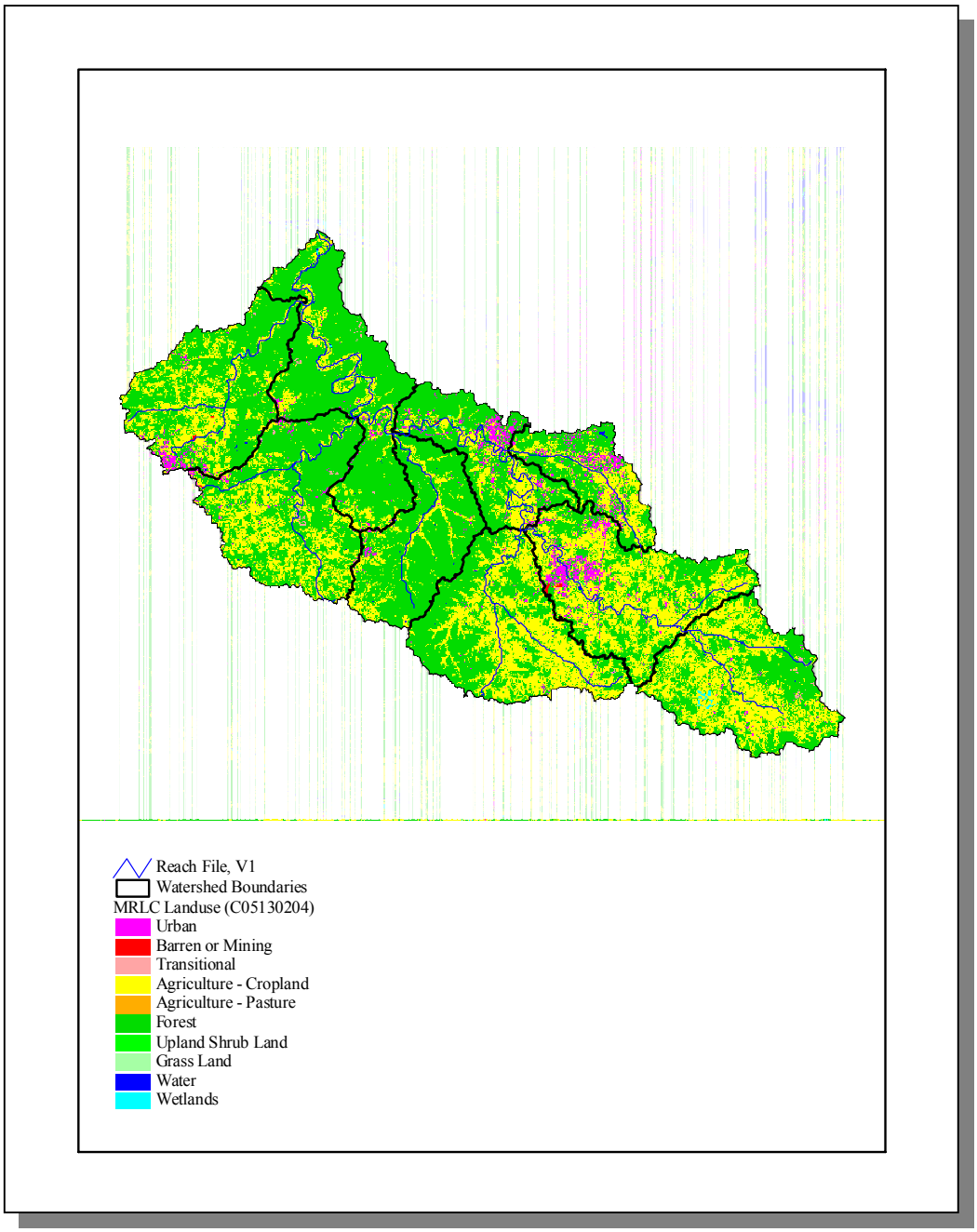

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

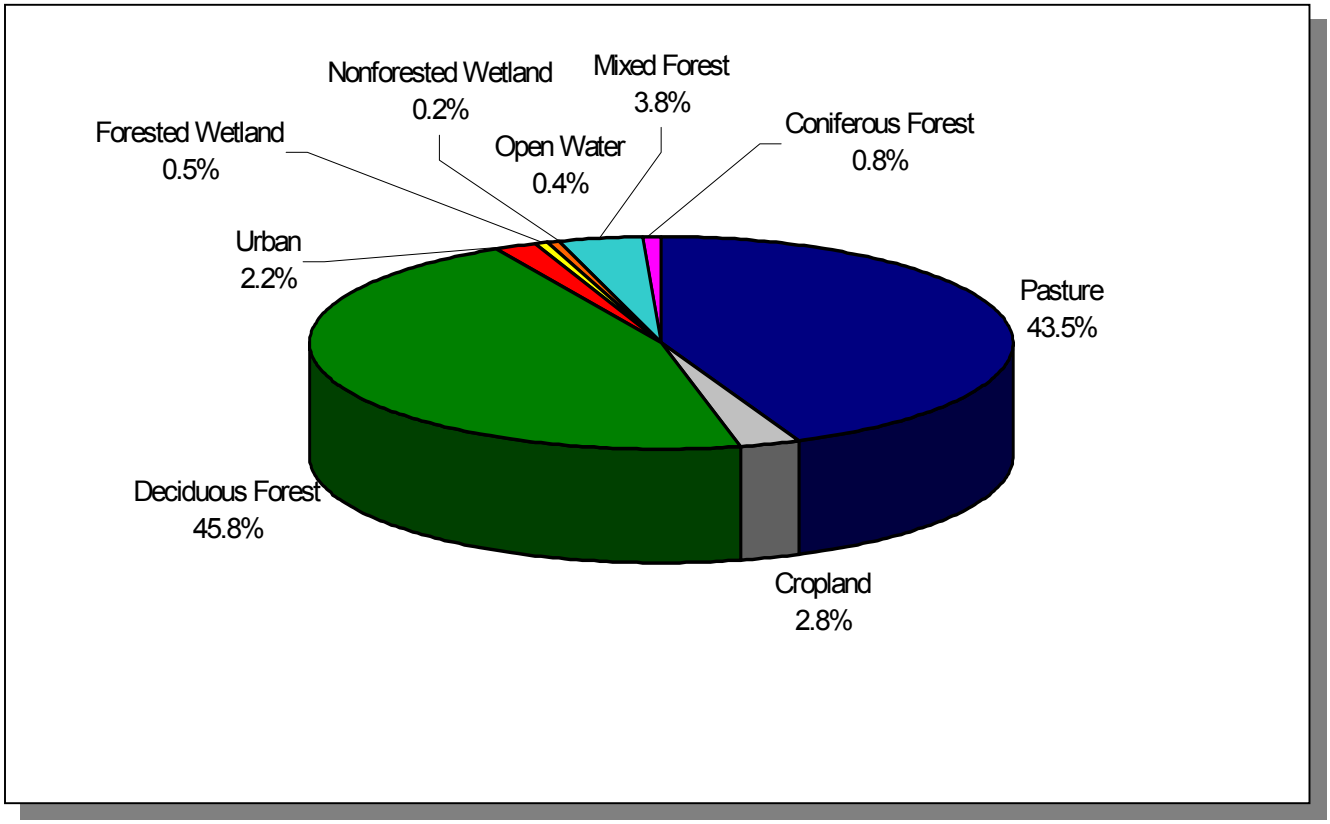

Figure 2-7. Land Use Distribution in the Harpeth River Watershed. *More information is provided in Harpeth-Appendix II.*

2.5 ECOREGIONS AND REFERENCE STREAMS. Ecoregions are defined as relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies include the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Harpeth River Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 3 Level IV subecoregions (Griffen, Omernik, Azavedo, 1997):

- Western Highland Rim (71f) is characterized by dissected, rolling terrain of open hills, with elevations of 400 to 1000 feet. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty, acidic and low to moderate in fertility. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock, moderate gradients, and relatively clear water. The oak-hickory natural vegetation was mostly deforested in the mid to late 1800's, in conjunction with the iron ore related mining and smelting of the mineral limonite, but now the region is again heavily forested. Some agriculture occurs on the flatter areas between streams and in the stream and river valleys: mostly hay, pasture, and cattle, with some cultivation of corn and tobacco.

- Outer Nashville Basin (71h) is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

- Inner Nashville Basin (71i) is less hilly and lower than the Outer Nashville Basin. Outcrops of the Ordovician-age limestone are common, and the generally shallow soils are redder and lower in phosphorus than those of the Outer Basin. Streams are lower gradient than surrounding regions, often flowing over large expanses of limestone bedrock. The most characteristic hardwoods within the Inner Basin are a maple-oak-hickory-ash association. The limestone cedar glades of Tennessee, a unique mixed grassland/forest/cedar glades vegetation type with many endemic species, are located primarily on the limestone of the Inner Nashville Basin. The more xeric, open characteristics and shallow soils of the cedar glades also result in a distinct distribution of amphibian and reptile species.

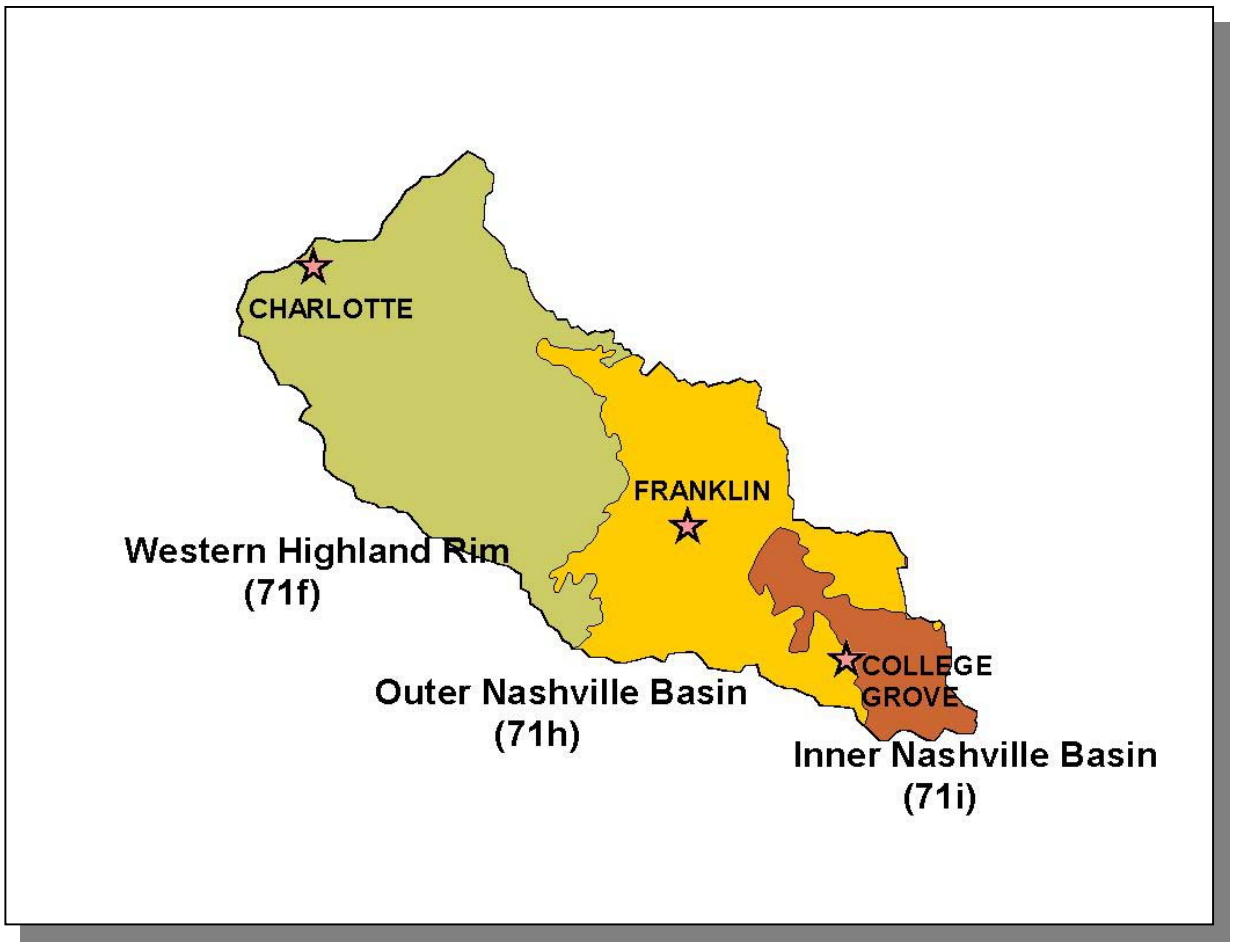

Figure 2-8. Level IV Ecoregions in the Harpeth River Watershed. *Locations of Charlotte, Franklin, and College Grove are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

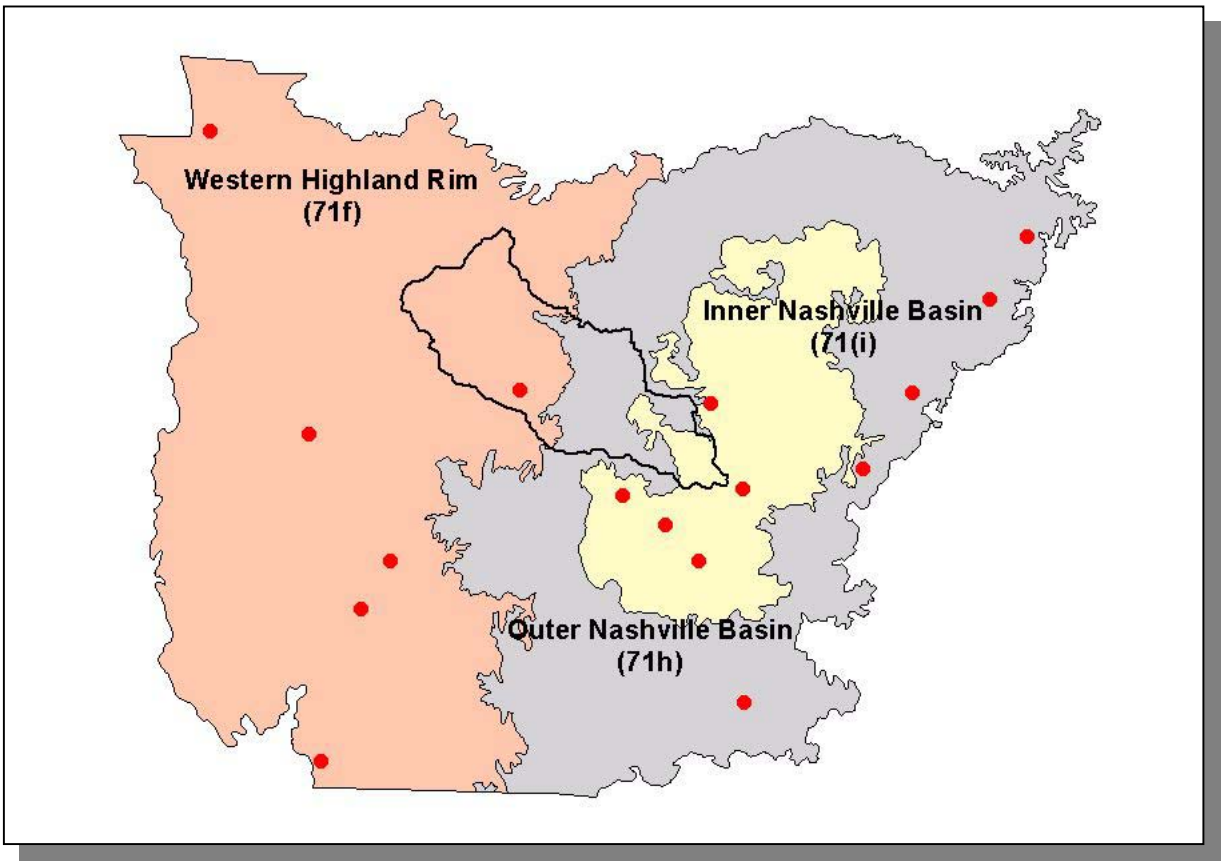

Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 71f, 71h, and 71i. *The Harpeth River Watershed is shown for reference. More information is provided in Harpeth-Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Areas. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. The Harpeth River Watershed has three Designated State Natural Areas:

Montgomery Bell Designated State Natural Area is an exemplary oak-hickory forest community of the Western Highland Rim (southern red oak-post oak-hickory, and white oak-southern red oak-hickory-tulip poplar).

Radnor Lake Designated State Natural Area is an 1100-acre area featuring an 85-acre lake. The site, one of Tennessee's first official state natural areas, has

some of the highest hills in the Nashville Basin. Radnor Lake is managed by Tennessee State Parks.

Sneed Road Cedar Glade Designated State Natural Area harbors a fairly extensive population of leafy prairie clover (*Dalea foliosa*), a rare plant in Tennessee.

Figure 2-10. There are Three Designated State Natural Areas in the Harpeth River Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the Federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	1
Insects	1
Mussels	3
Snails	2
Amphibians	1
Birds	6
Fish	3
Mammals	3
Reptiles	1
Plants	28
Total	**49**

Table 2-3. There are 49 Documented Rare Plant and Animal Species in the Harpeth River Watershed. Additional rare plant and animal species may be present.

Additionally, in the Harpeth River Watershed, there are three rare fish species, three rare snail species, two rare mussel species, and one rare crustacean species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Etheostoma microlepidum	Finescale darter		D
Etheostoma tippecanoe	Tippecanoe darter		D
Percina phoxocephala	Slenderhead darter		D
Lithasia duttoniana	Helmet rocksnail		
Lithasia geniculata	Ornate rocksnail		
Lithasia geniculata fulginosa	Geniculate river snail		
Dromas dromas	Dromedary pearlymussel	E	E
Epioblasma florentina walkeri	Tan riffleshell	E	E
Cambarus brachydactylus	Crayfish		

Table 2-4. Rare Aquatic Species in the Harpeth River Watershed. *Federal Status: E, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency.*

2.6.C. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at http://www.state.tn.us/environment/epo/wetlands/strategy.zip.

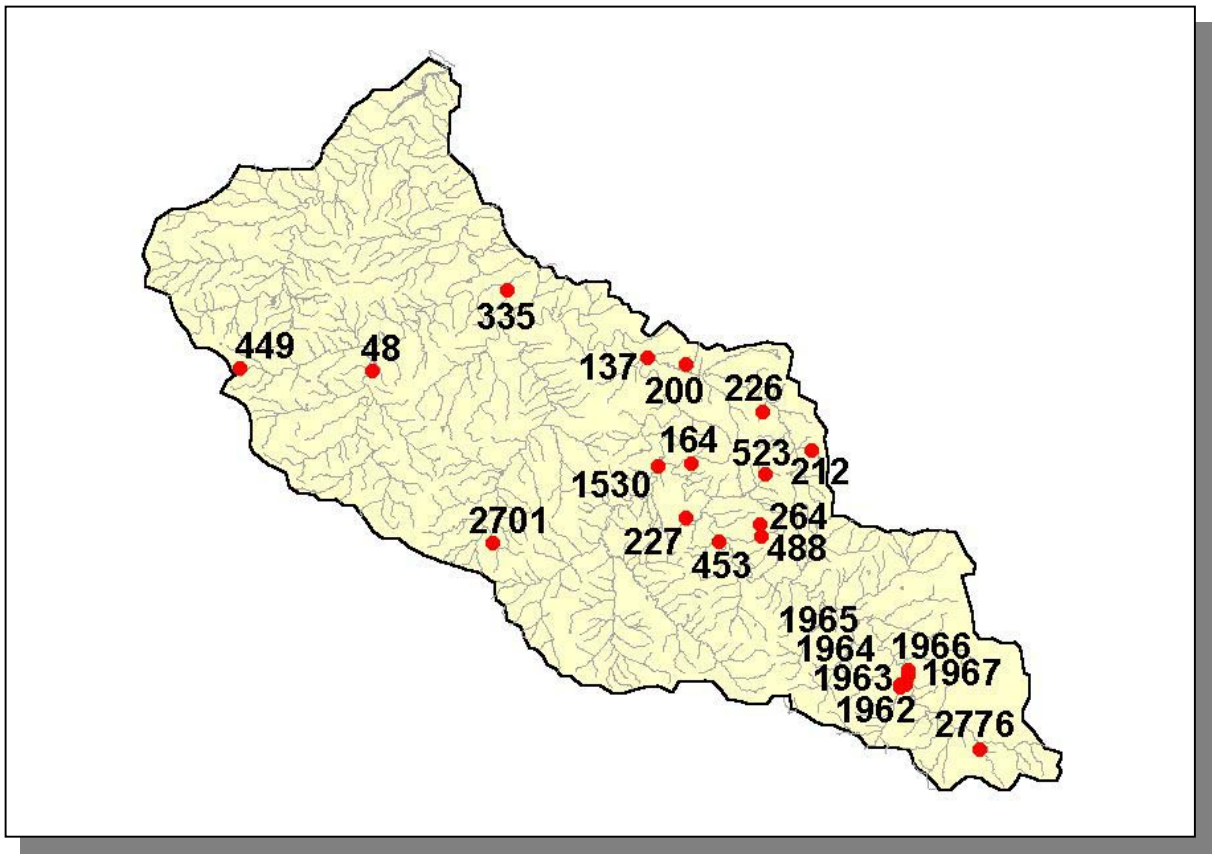

Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Harpeth River Watershed. *There may be additional wetland sites in the watershed. More information is provided in Harpeth-Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. State Scenic River. A portion of the Harpeth River has been designated by the Legislature as a State Scenic River. Only the portion of the Harpeth River in Davidson County is designated: The segment from Interstate 40 downstream to the Davidson-Cheatham County line (6.0 miles) is designated Class II, and the segment from State Highway 100 downstream to Interstate 40 (8.5 miles) is designated Class III. The Tennessee Scenic Rivers Act of 1968 defines Class II as pastoral river areas and Class III as partially developed river areas.

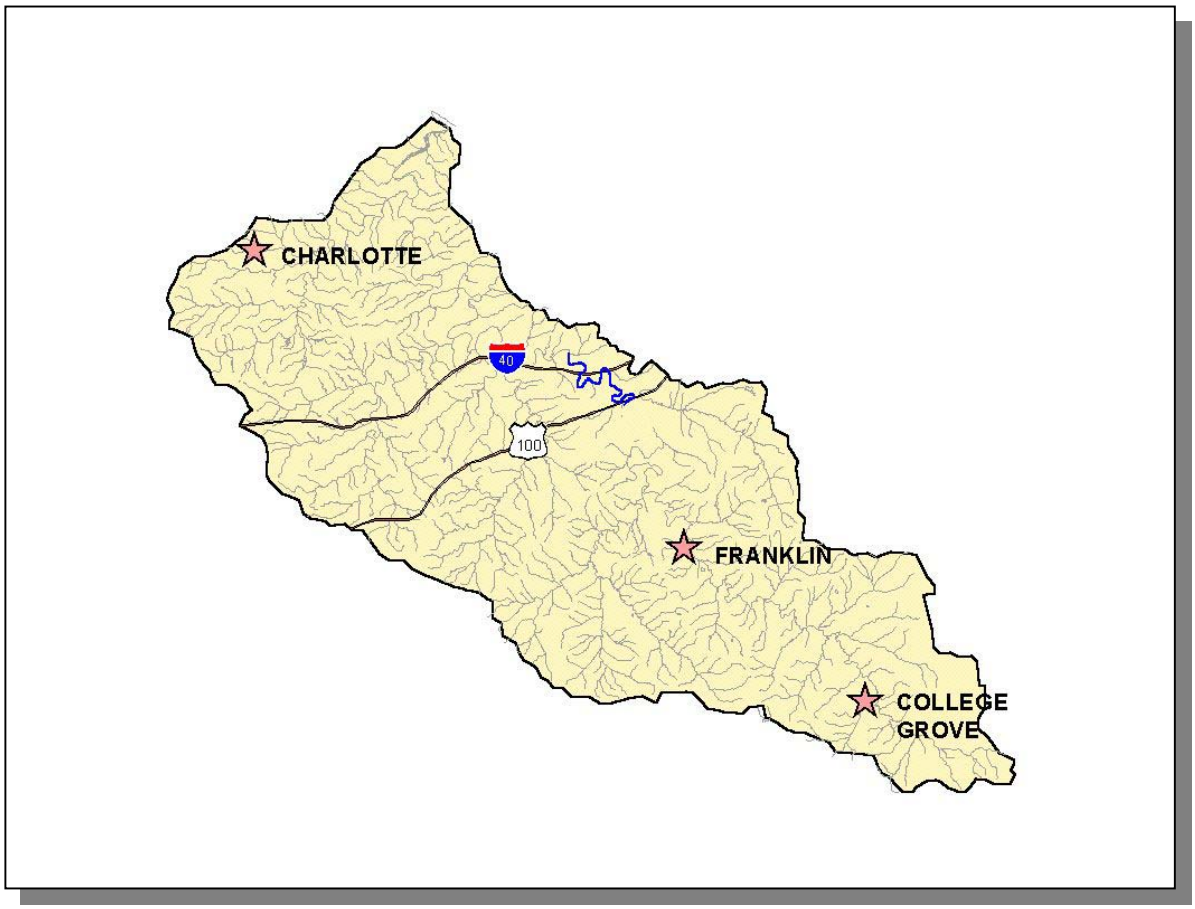

Figure 2-12. A Portion of the Harpeth River in Davidson County (From Highway 100 to the Davidson/Cheatham County Line) is Designated as a State Scenic River*. Locations of Charlotte, Franklin, and College Grove are shown for reference.*

2.7.B. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of four streams in the Harpeth River Watershed:

Big Turnbull Creek. Clear, small and very scenic forested stream with a forty-foot waterfall and numerous bluffs.

Harpeth River. Rich in history and of archeological significance; evidence of aboriginal towns; extraordinary tunnel at the Narrows; impressive carved bluffs, including Paint Rock which is adorned with petroglyphs.

Jones Creek. Narrow stream with frequent gravel bars; winds through picturesque valley; high, carved limestone bluffs.

South Harpeth River. High bluffs with extensive adjacent forested areas.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Big Turnbull Creek	X	X	X	X	X		
Harpeth River	X	X	X	X	X	X	X
Jones Creek	X	X	X	X	X		
South Harpeth River	X	X	X	X	X		

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/tn.htm

2.7.C. Greenways. Several efforts are underway in Williamson County to develop a greenway system that would include sections along the Harpeth River. Bellevue (in Davidson County) already has a one-mile greenway complete along the Harpeth River.

2.7.D. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- Hidden Lake, a mid 19th century quarry, later converted to a resort
- Montgomery Bell State Park, a 4500 acre state resort park
- Mound Bottom State Archaeological Area, the remains of a 13th century Native American village
- Newsom's Mill State Historic Area, an early 19th century grist mill
- Narrows of the Harpeth State Historic Area, the site of an early 19th century water tunnel that powered a mill
- Natchez Trace Parkway, a linear National Park interpreting the historic Natchez Trace

In addition, many local interpretive areas are common, most notably, Bowie Park in Fairview and Warner Park in Nashville.

2.7.E. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages the 20,810-acre Cheatham Wildlife Management Area near Ashland City.

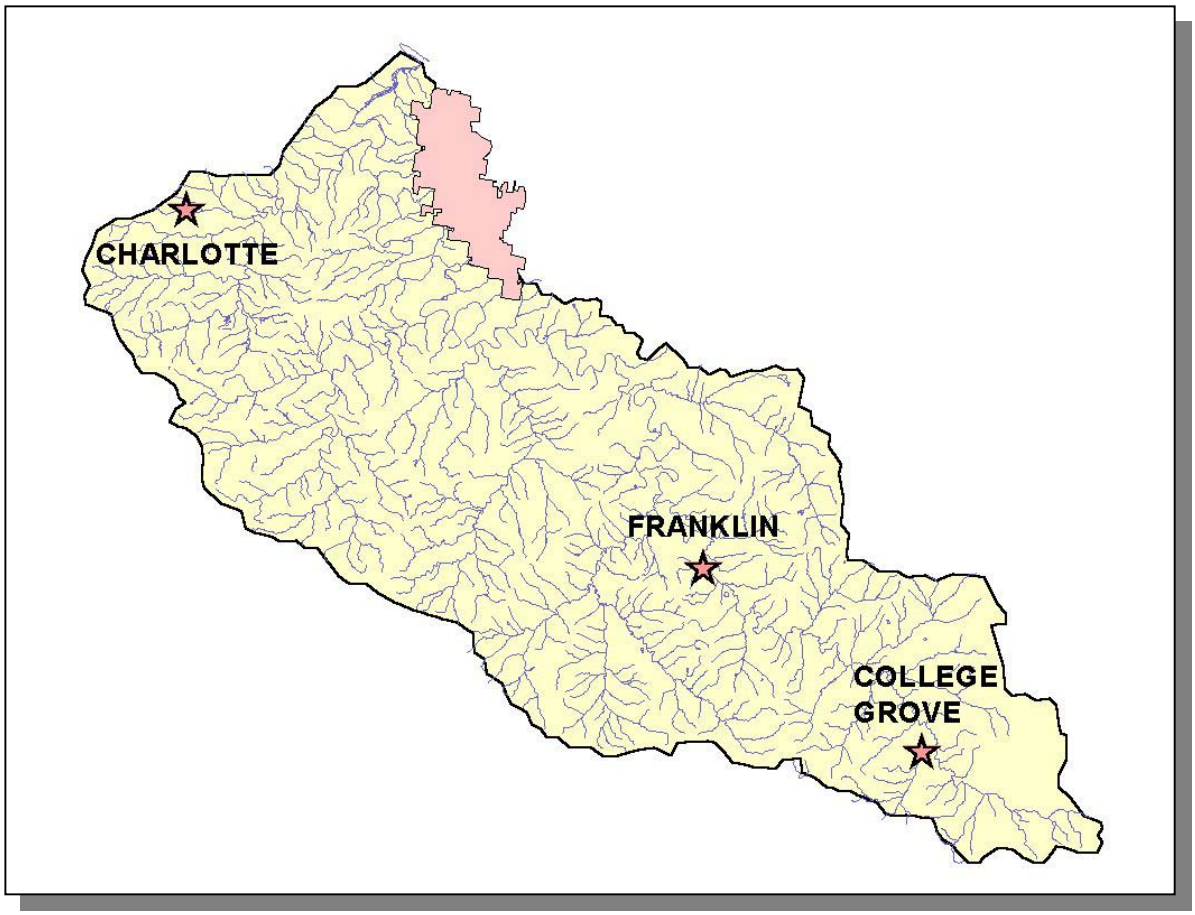

Figure 2-13. TWRA Manages Cheatham Wildlife Management Area in the Harpeth River Watershed. *Locations of Charlotte, Franklin and College Grove are shown for reference.*

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT.

The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/riv

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Arrington Creek	2			Little Harpeth River	2		
Beaverdam Creek	2	3		Little Jones Creek	2		
Brush Creek	2		2	Nails Creek	2		
East Fork Creek	3			Otter Creek	3		
Flatrock Branch Creek	2	3		South Harpeth Creek	3	3	
Harpeth River	1,2	1,2		Sulphur Fork Creek	3		
Jones Creek	2	2,3	1,2	Town Branch Jones Creek	2		
Leatherwood Creek	2			Turnbull Creek	1,2	3	
Leipers Fork							
West Harpeth River	2			West Harpeth River	2	2,3	

Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed as a fishery